



Air Quality Statement of Basis

May 7, 2004

**Tier II Operating Permit and Permit to Construct
Permit No. T2-030407**

**NW Design Molders Inc.
Jerome, Idaho**

AIRS ID No. 053-00005

Prepared by:

**Harbi Elshafei
Permit Writer**

Air Quality Division

FINAL REVISED PERMIT

Table of Contents

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE	3
1. PURPOSE.....	4
2. PROJECT DESCRIPTION.....	4
3. FACILITY DESCRIPTION	4
4. SUMMARY OF EVENTS/PERMIT HISTORY	4
5. TECHNICAL ANALYSIS	5
6. PERMIT REQUIREMENTS	7
7. AIRS INFORMATION	9
8. FEES.....	9
9. RECOMMENDATIONS.....	9
APPENDIX A – CONTROL OF VOC EMISSIONS FROM POLYSTYRENE FOAM MANUFACTURING,” AUGUST 1990 – REPORT DEVELOPED BY RADIAN CORP	
APPENDIX B – TIER II PROCESSIN FEE CALCULATIONS	
APPENDIX C – RESPONSE TO PUBLIC COMMENTS	

Acronyms, Units, and Chemical Nomenclature

acfm	actual cubic feet per minute
AIRS	Aerometric Information Retrieval System
AP-42	EPA's Compilation of Air Pollutant Emission Factors
AQCR	Air Quality Control Region
Btu	British thermal unit
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
EPS	expandable polystyrene
gr	grains
gr/dscf	grains per dry standard cubic feet
hp	horsepower
hr/yr	hours per year
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb	pounds
lb/day	pounds per day
lb/hr	pounds per hour
MACT	Maximum Available Control Technology
MMBtu	million British thermal units
MMBtu/hr	million British thermal units per hour
MMscf	million standard cubic foot
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NG	natural gas
NW	NW Design Molders, Inc
NO _x	nitrogen oxides
NSPS	New Source Performance Standards
OP	operating permit
PM	particulate matter
PM ₁₀	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PTC	permit to construct
PSD	Prevention of Significant Deterioration
scf	standard cubic foot
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SM	synthetic minor
T/yr	tons per any consecutive 12-month period
UTM	Universal Transverse Mercator
VOC	volatile organic compound(s)

1. PURPOSE

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01 Sections 400 through 470, *Rules for the Control of Air Pollution in Idaho* for Tier II OP's and Sections 200 through 228 for PTC's.

2. PROJECT DESCRIPTION

This project is to update and modify the previously issued Tier II OP. The changes to the permit are new source review related; therefore, the new permit is now a Tier II OP/PTC.

On March 25, 2003, NW Design Molders, Inc. (NW) submitted a PTC application and requested that the DEQ issue a PTC for a new AMD type P1500/0 pre-expander for the facility located in Jerome. The new AMD type P1500/0 Pre-expander was installed without a PTC. The AMD type P1500/0 pre-expander has a capacity of expandable polystyrene (EPS) of 1,200 lb/hr. The previously permitted Kurtz and NWB pre-expanders have a combined capacity of 700 lb/hr of EPS.

3. FACILITY DESCRIPTION

The EPS raw material, or beads, comes into the facility in 1,000-lb lined boxes. The beads contain an encapsulated blowing agent, pentane, usually 3.5 to 6.5% in the material by weight. The emissions rates at each phase of the operation vary according to such factors as the density of the expanded beads, the shape and size of the molded part, and the finished goods storage requirements. The beads are typically vacuum fed from the boxes to the pre-expander where the beads are partially expanded to the desired density (referred to as "prepuff").

About 25% of the pentane is released in the expansion process. The material is then aged 6 to 48 hours to allow the prepuff to stabilize by diffusing air into the expanding beads. About 20% of the initial pentane is released during this aging process. The material is then transferred directly to molds where, with the use of steam, they are fused together into shapes created by the forms. About 15 to 25% of the initial pentane is released during the molding process. In the post-molding phase, about 15% of the initial pentane is released in the first 24 hours and 10% in the next 24 hours. The remaining 5 to 15% pentane diffuses out of the product over a long period.

The emissions points as described are identified in a report written by Radian Corporation for the EPA in Table 5-1 and Figure 5-2. The report can be found in Appendix A of this statement of basis.

The emissions sources of the facility include the:

- Boiler (Superior, Model 6-x-750, natural gas-fired, 6.3 MMBtu/hr, 150 hp).
- EPS bead processing equipment: AMD type P1500/0 pre-expander, Kurtz pre-expander, NWB Pre-expander, prepuff storage area, molding, presses, post molding aging (the first 24 hours), and product storage (the second 24 hours).

4. SUMMARY OF EVENTS/PERMIT HISTORY

September 22, 2002: DEQ issued Tier II OP No. 053-00005 for NW.

March 25, 2003:	NW submitted a PTC application to install an type AMD P1500/0 Pre-expander. DEQ treated the application as Tier II OP/PTC. The old permit numbering system (e.g., 053-00005) was based on a facility's AIRS number. The new permit number (e.g., T2-030407) is a chronological project numbering system.
April 22, 2003:	The Tier II OP/PTC application was determined incomplete.
June 20 and July 7, 2003:	NW submitted additional information to DEQ.
July 21, 2003:	The Tier II OP/PTC application was determined complete.
September 25, 2003	A public comment period started on September 25 and ended on October 27, 2003. Comments and responses are included in Appendix C of this statement of basis.
June 14, 2004	NW submitted the Tier II OP processing fee of \$5,000.00.

5. TECHNICAL ANALYSIS

Process Description

The EPS raw material (beads) arrives at the facility in 1,000-pound boxes. The beads are analyzed for pentane to ensure they meet required specifications. The beads are stored at the facility until they are needed for expansion. The beads are transferred into a hopper and fed to the pre-expanders by an auger. The beads are partially expanded to the desired density using steam from a natural gas-fired boiler to heat the beads to release pentane, which is the encapsulated blowing agent contained in the beads. The expanded beads are then aged in prepuff storage for six to 48 hours to allow the prepuff to stabilize. After aging the material is transferred either to shape molding presses or to block molding. The EPS is put into a mold. Steam is added, and a fusion process occurs that bonds the EPS beads together. The fused EPS beads are then stored for curing. The forms are then cut to the final shape and stored. Each step of the process results in pentane emissions.

The facility has a natural gas-fired boiler with a heat input capacity of 6.3 MMBtu/hr. The boiler is used to generate steam for processes at the facility.

Emission Estimates

Emissions estimates from the EPS expansion, molding, and storage operations were based on the report: *EPA-450/3-90-020 Control of VOC Emissions from Polystyrene Foam Manufacturing*, August 1990, developed by Radian Corporation for the EPA (Appendix A). The report established that, on average, 85% of the original pentane (pentane is the only VOC within the EPS beads by weight would be released during the processes used to develop the expanded plastic foam products). The hourly emissions estimate was based on the equipment's maximum hourly throughput and a 7% pentane concentration (the facility's estimate). The permit limits the pentane concentration to 7% and requires tracking of the pentane concentration in the material purchased to show compliance with the 7% limit. The annual limit was written to ensure that the major source threshold level is not exceeded.

The NW's Tier II OP No. 053-00005 issued on September 22, 2000, established the following VOC emissions and EPS throughput limits from the facility:

VOC: 38 lb/hr and 13.6 tons per year (T/yr)

Throughput for EPS beads: 455 lb/hr and 227.5 T/yr; EPS beads shall not contain pentane of greater than 7% by weight.

The new installed pre-expander (AMD type P1500/0) has a capacity of 1,200 lb/hr EPS beads.

Therefore, using the information reported in the Control of VOC Emissions from *Polystyrene Foam Manufacturing*, the VOC potential to emit from the AMD type P1500/0 pre-expander is calculated as follows:

$$1,200 \text{ lb/hr} \times 8,760 \text{ hr/yr} \times 0.07 \times 0.85 \times 1 \text{ ton}/2,000 \text{ lb} = 312.73 \text{ T/yr.}$$

Thus, the potential to emit for the VOC from the entire facility is equal to 326.33 T/yr (312.73 + 13.6).

The estimated VOC emissions are greater than the major source thresholds (100 T/yr and 250 T/yr).

To limit the facility's VOC emissions to below the major source thresholds and to ensure synthetic minor status, NW accepted daily and annual throughput limits of EPS beads used at the facility of 28,800 lb/day and 1,248 T/yr, respectively. This equates to VOC emissions rates of 1,783 lb/day and 74.3 tons per any consecutive 12-month period (T/yr).

The boiler emissions of PM₁₀, NO_x, CO, VOC, and SO₂ were estimated using the latest emissions factors from AP-42, Section 1.4 (Natural Gas Combustion, External Combustion Sources, 3/98). The boiler's capacity is equal to 6.3 MMBtu/hr.

Example calculation:

$$(6.3 \text{ MMBtu/hr}) \times (1 \text{ scf NG} / 1,050 \text{ Btu}) \times (7.6 \text{ lb PM}_{10} / 1 \text{ MMscf NG}) = 0.0456 \text{ lb/hr PM}_{10}$$

Table 5.1 EMISSIONS INVENTORY BASED ON PTE

NW Design Molders Inc., Jerome											
Potential Emissions* – hourly (lb/hr), daily (lb/day) and annual (T/yr)											
Source Description	PM ₁₀		NO _x		CO		VOC			SO ₂	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	lb/day	T/yr	lb/hr	T/yr
Boiler, Superior, 6.32 MMBtu/hr natural gas	0.05	0.20	0.60	2.63	0.50	2.21	0.03	NA	0.14	0.004	0.02
Pre-expanders, prepuff storage area, molding, presses, post molding aging (1 st 24 hrs) and product storage (2 nd 24 hrs)	NA	NA	NA	NA	NA	NA	71.4	1,783	74.3	NA	NA
Total	0.05	0.20	0.60	2.63	0.50	2.21	71.43	1,783	74.44	0.004	0.02

* As determined by a pollutant-specific U.S. EPA reference method, a DEQ-approved alternative, or as determined by the DEQ's emissions estimation methods used in this permit analysis.

The grain-loading limit specified in Permit Condition 2.11 will not necessitate monitoring the boiler emissions when natural gas is used because at the maximum rate of operation, the calculated particulate matter (PM) concentration does not exceed the limit, as follows:

$$(0.05 \text{ lb PM} / 1 \text{ hour}) \times (1 / 1500 \text{ acfm}) \times (1 \text{ hour} / 60 \text{ min}) \times (7,000 \text{ gr} / 1 \text{ lb}) = 0.004 \text{ gr/acf}$$

The actual exit flow rate from this boiler is unknown. The exit flow rate value used in this calculation is a typical flow rate for this size of boiler.

The resulting grain loading value is compared to the regulatory limit of 0.015 gr/dscf. The conversion from actual to dry standard cubic feet is unlikely to result in a difference that would result in the standard being exceeded.

Facility Classification

The facility is not a designated facility as defined in IDAPA 58.01.01.006.27. The AIRS facility classification is SM (potential uncontrolled emissions are greater than 100 T/yr but permitted potential emissions are less than 100 T/yr). The facility is not subject to PSD Permitting requirements because the facility's potential to emit is less than PSD major source classification. This facility is an expanded plastic foam product manufacturing facility, SIC code 3086.

Area Classification

NW Design Molders, Inc. is located in Jerome County, which is located in AQCR 63 and UTM Zone 11. The area classification is unclassifiable for all regulated air pollutants.

Modeling

Air dispersion modeling was not required for this permit because the emissions from the 6.3 MMBtu/hr gas fired boiler are negligible.

Toxic Pollutants

Pentane is a toxic air pollutant. The increase in pentane emissions from this permit modification is 33.4 lb/hr (71.4 lb/hr in Tier II OP No. T2-030407 – 38 lb/hr from Tier II OP No. 053-00005, issued on September 22, 2000), which is less than the screening emissions level of 118 lb/hr.

6. PERMIT REQUIREMENTS

This section addresses the Tier II OP requirements.

Regulatory Review

6.1 Permit Scope

NW Design Molders has requested a modification of its permit to cover new equipment installed in 2001. This modification allows an increase in the production rate from the permitted 455 lb/hr to 1,200 lb/hr of EPS beads and an increase in the VOC emissions from 38 lb/hr to 71.4 lb/hr. Also, the annual permitted VOC emissions are increased from 13.6 T/yr to 74.3 T/yr.

6.2 Facility-wide Conditions

The previous permit had requirements specifically for the natural gas boiler. These requirements are now included in Permit Condition 2.11 (Fuel-Burning Equipment) in the facility-wide provisions.

The rest of the facility-wide conditions (Permit Section 2) are self-explanatory and no additional detail is necessary in this Statement of Basis.

VOC Emissions Limits

(Permit Condition 3.3)

The combined VOC emissions from the pre-expanders, the prepuff aging storage area, molding, presses, the post molding aging (the first 24 hours), and product storage (the second 24 hours) shall not exceed 1,783 lb/hr and 74.3 tons per any consecutive 12-month period.

The hourly VOC emissions limit was based on the potential to emit using the maximum process rate of 1,200 lb/hr and the maximum pentane concentration of 7% by weight. It is assumed that 85% by weight of the original pentane (pentane is the only VOC) within the EPS beads would be released during the processes used to develop the expanded plastic foam products.

The annual VOC emissions limit was set to ensure facility synthetic minor status.

Compliance Demonstration

(Permit Condition 3.6)

The facility is required to track the daily and annual EPS bead throughput rates and maintain documentation for each purchase of EPS beads. The documentation must show the percent pentane by weight. Because pentane is the only VOC, calculating the pentane emissions will determine the total VOC emissions. According to the Radian report (Appendix A), 85% of the total VOC present is emitted in the manufacturing process. The equations to determine the daily and annual VOC emissions are as follows:

$$\text{Daily VOC} = \text{Throughput (lb/day)} \times \% \text{ pentane} \times 0.85 \times \text{day/hours of operations}$$

$$\text{Annual VOC} = \text{Throughput (lb/yr)} \times \text{average \% pentane} \times 0.85 / 2000 \text{ lb/T}$$

Throughput Limits

(Permit Condition 3.4)

The maximum daily throughput of the pre-expander shall not exceed 28,800 lb/day. The maximum annual throughput of the pre-expander shall not exceed 1,248 T/yr.

The daily limit was set based on the maximum capacity of the equipment (1,200 lb/hr). The annual limit was set to ensure facility synthetic minor status.

Compliance Demonstration

(Permit Condition 3.6)

The permittee is required to monitor and record the throughput of EPS beads for each day and for the most recent 12-month period. The records can be compared to the permitted throughput limit to determine compliance.

Pentane Limit

(Permit Condition 3.5)

The permittee shall not expand EPS beads that contain pentane greater than 7% by weight.

The pentane concentration in the EPS beads was limited to 7% to ensure compliance with the daily and annual VOC emissions limits.

Compliance Demonstration

(Permit Condition 3.6)

The permittee is required to monitor and record documentation for each purchase of EPS beads. The documentation must show the percent pentane by weight for the EPS beads. To show compliance, each of these records should indicate that the beads contain pentane by weight less than or equal to 7%.

6.3 New Source Performance Standard Applicability

NW Design Molders's steam boiler's capacity is 6.3 MMBtu/hr, which is less than the 10 MMBtu/hr or lower applicability limit for steam-generating units per 40 CFR 60 Subpart Dc.

6.4 National Emission Standards for Hazardous Air Pollutants Applicability

Because the EPS beads are used but not manufactured at NW Design Molders, 40 CFR 63 Subpart JJJ does not apply.

6.5 Compliance Issues

The facility installed a new pre-expander without obtaining a required PTC. The issue has been referred to DEQ's compliance staff for review.

7. AIRS INFORMATION

AIRS/AFS FACILITY-WIDE CLASSIFICATION DATA ENTRY FORM							
Air Program	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	TITLE V	AREA CLASSIFICATION A – Attainment U – Unclassifiable N – Nonattainment
Pollutant							
SO ₂	B						U
NO _x	B						U
CO	B						U
PM ₁₀	B						U
PT (Particulate)	B						
VOC	SM					SM	
THAP (Total HAPs)	B						
			Applicable Subpart				

AIRS/AFS Classification Codes:

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant that is below the 10 T/yr threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

8. FEES

A PTC application fee is required as per IDAPA 58.01.01.224. The increase in VOC emissions resulting from the installation of the pre-expander is 60.7 T/yr (74.3 T/yr in Tier II OP No. T2-030407 – 13.6 from Tier II OP No. 053-00005, issued on September 22, 2000). Thus, the emissions increase is between 10 and 100 T/yr. Therefore, a Tier II operating permit processing fee of \$5,000 is required. The fee calculation spreadsheet is in Appendix B.

9. RECOMMENDATIONS

Based on the review of the application materials, and all applicable state and federal regulations, staff recommends that DEQ issue modified Tier II Operating Permit and Permit to Construct No. T2-030407 to NW Design Molders', Inc. Jerome facility. A public comment period on the air quality aspects was provided on the revised permit in accordance with IDAPA 58.01.01.404.02.b and 58.01.01.209.01.c.

HE/sd

G:\Air Quality\Stationary Source\SS Ltd\T2\NW Design Molders\Final\T2-030407 Final SOB.doc

APPENDIX A

NW Design Molders, Inc., Jerome

Project No. T2-030407

*"EPA-450/3-90-020 Control of VOC Emissions From Polystyrene Foam
Manufacturing," August 1990*

Developed by Radian Corporation for the EPA

FOAM MOLDERS, INC.
9456 N. McGUIRE RD.
POST FALLS, ID. 83854
208-777-8485
FAX: 208-777-9527

[REDACTED]
[REDACTED]
[REDACTED]
STATE OF IDAHO

FAX TRANSMITTAL

DATE: 6/20/03
FROM: GARY

TO: HARB. ELSHAFEI
OF: DEQ
FAX #: 208-373-0154

MESSAGE: PLEASE SEE THE ATTCHED PAGES. IF THIS IS NOT COMPLETE
PLEASE GIVE ME A CALL.

NUMBER OF PAGES 24 IF YOU DO NOT RECEIVE THESE PAGES OR THEY DO NOT
COME IN CLEAR PLEASE CALL US AT 208-777-8485 AND WE WILL RE-SEND THEM.
THANKYOU

Attachment H



Bead Size Distribution & Volatile Content

11 Apr 03

Customer Service (800) 448-6232

Product	Lot #	Date	% Volatiles *	10 Mesh	12 Mesh	14 Mesh	16 Mesh	18 Mesh	20 Mesh	25 Mesh	30 Mesh	35 Mesh	40 Mesh	45 Mesh	50 Mesh	60 Mesh
MB500K	122244	4/1/03	6.9	0.0	0.0	0.0	3.6	38.9	43.2	13.9	0.4	0.0	0.0	0.0	0.0	0.0 - 5
MB500K	122245	4/1/03	6.9	0.0	0.0	0.0	4.3	43.8	40.6	10.9	0.1	0.0	0.0	0.0	0.0	0.0 - 16
MB500K	122260	4/4/03	6.9	0.0	0.0	0.0	3.0	42.9	42.5	11.0	0.2	0.1	0.0	0.0	0.0	0.0 - 20
MB500K	122261	4/5/03	7.0	0.0	0.0	0.0	3.4	40.3	43.6	12.5	0.2	0.0	0.0	0.0	0.0	0.0 - 1

B/L # 1021518

* Actual Pentane Content equals % Volatiles minus 0.1%

**CONTROL OF VOC EMISSIONS FROM
POLYSTYRENE FOAM MANUFACTURING**

CONTROL TECHNOLOGY CENTER

SPONSORED BY:

Emission Standards Division
Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

Air and Energy Engineering Research Laboratory
Office of Research and Development
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

Center for Environmental Research Information
Office of Research and Development
U.S. Environmental Protection Agency
Cincinnati, OH 46268

August 1990

Attachment H, Foam Molders

**CONTROL OF VOC EMISSIONS FROM
POLYSTYRENE FOAM MANUFACTURING**

by

C.J. Bagley
J.S. McLean
M.B. Stockton
Radian Corporation
P.O. Box 13000
Research Triangle Park, North Carolina 27709

EPA Contract No. 68-02-4378

Work Assignment Manager

David Beck
Emission Standards Division
Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

Prepared for:

Control Technology Center
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

PREFACE

The purpose of this document is to provide technical information to States on estimating and controlling volatile organic compounds (VOC) emissions from the manufacture of polystyrene foam (PSF). This document addresses the expandable polystyrene bead industry, and the extruded polystyrene foam and sheet industries.

The Control Technology Center (CTC) was established by EPA's Office of Research and Development (ORD) and Office of Air Quality Planning and Standards (OAQPS) to provide technical assistance to State and Local air pollution control agencies. Three levels of assistance can be accessed through the CTC. First, a CTC HOTLINE has been established to provide telephone assistance on matters relating to air pollution control technology. Second, more in-depth engineering assistance can be provided when appropriate. Third, the CTC can provide technical guidance through publication of technical guidance documents, development of personal computer software, and presentation of workshops on control technology matters.

The technical guidance projects, such as this information document, focus on topics of national or regional interest that are identified through contact with State and Local agencies. In this case the CTC undertook the investigation of volatile organic compound (VOC) emissions and their control for the production of polystyrene foam. The document includes descriptions of the production processes used, associated emissions, available controls, and estimated costs for applying controls.

1.0 INTRODUCTION

The purpose of this study was to conduct a survey of the polystyrene foam (PSF) manufacturing industry to characterize the industry, define the nature and scope of volatile organic compound (VOC) emissions from this source category, identify potential controls for reducing VOC emissions, and develop cost estimates for VOC capture and control technologies. The study includes an estimate of total industry VOC emissions and the geographic distribution of industry facilities. A process overview and descriptions of three separate manufacturing processes used for polystyrene foam products are presented in this report, and process emission points are identified. The report also includes a review of demonstrated and potential emission control options that have been identified for reducing VOC emissions from this source category. The estimates of VOC emissions are not based on empirical data, but were calculated based on figures and assumptions from industry and government reports. Cost estimates for capture and control of VOC emissions have been developed according to the U.S. Environmental Protection Agency's (EPA) Office of Air Quality Planning and Standards (OAQPS) Control Cost Manual, 1990.

Many previous studies of this source category have focused primarily on chlorofluorocarbon (CFC) rather than VOC emissions. However, with the adoption of the Montreal Protocol (40 CFR Part 82) in August 1988, which restricts the production and consumption of a number of fully halogenated CFCs, the use of hydrocarbons and soft CFCs as blowing agents in the polystyrene foam manufacturing process has increased.

This increased use of hydrocarbon blowing agents will likely result in increased VOC emissions from this source category nationwide. With the continued and increasing ozone non-attainment problems facing many U.S. metropolitan areas, EPA is evaluating the potential for reducing emissions from all sources of VOC. In 1988, 101 urban areas in the United States

were classified as non-attainment areas for ozone. It is estimated that over 170 polystyrene foam manufacturing plants are located in non-attainment areas. National annual VOC emissions from this source category are estimated at 25,000 short tons per year. Approximately 68 percent of source facilities identified in this report are located in ozone non-attainment areas. Therefore, the PSF industry represents a source of VOC emissions which may be affecting local air quality in many urban areas of the United States.

2.0 CONCLUSIONS

The major findings of this study are presented below. The conclusions can be categorized into three groups: 1) industry characterization, 2) VOC emissions and emission controls, and 3) control cost estimates. In general, due to the eventual phaseout of CFCs, it is expected that VOC emissions from this source category will increase over time unless emission control equipment is installed or alternative blowing agents are used. Add-on controls such as carbon adsorption and incineration have been demonstrated for this industry. In addition, some existing facilities have successfully switched from hydrocarbon blowing agents to hydrochlorofluorocarbon (HCFC) blowing agents. HCFCs have only a fraction of the ozone depletion potential of CFCs and are, for the present, considered an environmentally acceptable alternative to both hydrocarbon and CFC blowing agents. The PSF industry, however, considers the regulatory status of HCFCs uncertain, and other alternatives are being actively investigated.

2.1 INDUSTRY CHARACTERIZATION

- Polystyrene foam manufacturing consists of three separate processes for producing foam sheet, foam board, and expandable beads. Initial estimates indicate that the expandable bead process results in the greatest VOC emissions during processing, followed by foam sheet production. Extruded foam board is still primarily manufactured using CFCs as the blowing agent, and, therefore, VOC emissions are negligible;
- The polystyrene foam blowing industry is made up of many companies of widely varying sizes which purchase polystyrene or expandable polystyrene beads (EPS) and manufacture specialty foam products. These plants are spread geographically throughout the United States, and plants are located in 37 states;

- Polystyrene foam can be blown with a number of different blowing agents. Until the late 1980s, CFCs were the blowing agent of choice for extruded PSF products. Due to an eventual phaseout of fully halogenated CFCs, the industry is switching to HCFCs and hydrocarbons as alternative blowing agents. The EPS process continues to primarily use pentane as the blowing agent, while isopentane and n-butane are used occasionally.

2.2 VOC EMISSIONS

- National VOC emissions from polystyrene foam blowing in 1988 are estimated at 25,000 short tons per year;
- There are three general classes of emissions from polystyrene foam: manufacturing emissions; prompt foam cell losses, which are losses that typically occur during storage and shipping; and banked emissions, which are losses that occur through slow diffusion of blowing agents out of the foam over the life of the product. This report focuses on emissions during manufacturing, because they are significant and controllable. Less attention is given to emissions during storage and shipping. Banked emissions are characterized to some extent, but discussion is limited because no controls for banked emissions have been identified (except, of course, for manufacturing with alternate blowing agents);
- Exhaust streams from individual plants are typically characterized by high flow rates and low VOC concentrations due to OSHA regulations for minimizing worker exposure to pentane and ventilation systems design requirements to ensure that concentrations remain below 25 percent of the Lower Explosive Limit (LEL) to minimize fire and explosion hazards.

2.3 VOC EMISSIONS CONTROLS

- Incineration is a demonstrated and readily available add-on control technology for reducing VOC emissions from polystyrene foam blowing. Incineration can reduce captured VOC emissions by 98+ percent; however, the cost per ton of VOC removed can be relatively high due to the large exhaust flow rates and low VOC concentrations characteristic of the exhaust stream. PSF plants that have successfully incinerated emissions generally have

3.0 INDUSTRY STRUCTURE

Polystyrene foam (PSF) products are manufactured by one of two basic processes, extrusion or expandable bead blowing. Both of these manufacturing processes are described in detail in Section 4.0. Foam extrusion and expandable polystyrene (EPS) bead blowing each produce distinct end products, and involve distinct populations of manufacturing companies. This section of the report describes the products manufactured from PSF, the companies that produce PS and finished PSF products, and recent market trends.

3.1 END PRODUCTS

In general, PSF products are used for various packaging and/or insulation purposes. The density, strength, formability, and insulating qualities of PSF make it an ideal material for the familiar packing "peanuts," hamburger boxes, and hot or cold drink cups. A 1988 estimate of end uses for polystyrene resin indicates that extruded foam board products account for 11 percent, single service extruded sheet products account for 25 percent, all other sheet 22 percent, and EPS products account for 41 percent of total U.S. PSF production (approximately 1354 million lb/yr). Total PSF production in turn accounts for approximately 26 percent of total polystyrene use.¹

3.1.1 Extruded Products - Boardstock and Sheet

Extruded PSF products include those made from foam board and foam sheet. Market figures for 1988 from the Journal of Modern Plastics indicate that about 60 percent of PSF products are extruded.² The vast majority of PSF board is used as insulation material in commercial and residential construction. Foam board is somewhat higher than fibrous glass in insulating efficiency and comparable in cost in dollars per R-factor (heat-resistance factor), and is also practical in certain construction designs where traditional insulating materials are not.

Extruded PSF insulation has high resistance to moisture and to freeze/thaw damage and, consequently, retains its insulating quality longer than other foam insulation materials. It is particularly well suited to insulating around building foundations.³ Some PSF board is laminated with facing materials that increase the board's moisture resistance and retain the insulating capabilities (i.e., the blowing agent) longer.

Foam sheet products are used largely for packaging, most notably for food packaging and single service packaging. The most familiar examples of foam sheet products are fast food containers, meat and produce trays used in grocery stores, and disposable plates. Table 3-1 lists the major end uses of PS foam board and sheet and presents total U.S. consumption of polystyrene foam products in 1987 and 1988.

3.1.2 Expandable Bead Products

Expandable polystyrene (EPS) beads are primarily used for foam board and sheet, foam packaging parts, and foam cups and containers as shown in Table 3-1. Most EPS beads are sold in bulk to foam processing companies who expand the beads to the required density and mold them in "steam chest" molds. About half the PSF insulating board is produced from the extruded process and half from the blown bead process. Physical properties such as thermal retention and dimensional stability are about equivalent at comparable densities.⁴ However, EPS insulation board is considerably less expensive than extruded PS board or polyurethane board. Blown bead insulation board is used primarily in large commercial roofing applications and exterior wall systems.

PSF packaging materials include loose fill, such as "shells" and "peanuts," as well as molded shapes such as those that protect audio equipment during shipping. Loose fill, or dunnage, is manufactured with a combination of extrusion and EPS operations.

3.1.3 Substitute and Competing Products

For most extruded and expandable bead PSF products there are competing products. However, there are trade-offs in performance, such as insulation properties for heat retention, and environmental concerns such as recyclability to be considered. For example, PSF sheet is used for fast food packaging primarily by McDonald's Corporation. Other fast food operations, such as Wendy's, Arby's, and Burger King use various plastic or

foil laminated paper products for wrapping food; the cost is approximately equivalent for all of these wrapping options. Different companies choose different wraps, based on effectiveness, perceived attractiveness, or consumer appeal.⁶ Egg cartons are manufactured from PSF sheet or from paper. Recent aggressive marketing by the paper industry has resulted in increased competition between paper and PSF sheet manufacturers of egg cartons. Recently, PSF waste disposal has become an important issue. Concern over landfilling and harm caused to marine mammals have received a certain amount of consumer attention and could affect competition. Industry is beginning recycling efforts for PSF products.

Foam insulating materials have become popular in construction since the early 1970s. However, polyurethane/polyisocyanurate and other products such as phenolic and fibrous glass board are still more commonly used than PSF for this purpose. Because of its superior moisture resistance, PSF insulation board has advantages over other insulation boards for below grade insulation.

3.2 MAJOR MANUFACTURERS OF PSF

3.2.1 Polystyrene Producers

Polystyrene is the raw material for extruded PSF products. About 20 to 25 percent of polystyrene resin produced is used in foam products. Relatively few large chemical companies produce the polystyrene polymer. Most extruded PSF products are also manufactured by these large polystyrene producers. Blowing agent is incorporated into the polystyrene as it is extruded. Expanded polystyrene products, however, are made from polystyrene beads, which contain an inactive blowing agent. These beads are usually produced by the large chemical companies, but they are expanded and molded at different facilities, as described in the following section. Table 3-2 lists the major U. S. producers of polystyrene resin and the estimates from three sources of their respective annual capacities for polystyrene production. Note that these figures for polystyrene production include resin used for some products other than foam products.

3.2.2 Foam Blowers

In some cases, PSF products are manufactured by the PS producing companies. However, most PSF facilities do not produce PS. These companies purchase PS and EPS beads as raw materials from PS producing

4.0 POLYSTYRENE MANUFACTURING PROCESSES

4.1 PROCESS HISTORY AND OVERVIEW

The three primary forms of PSF are extruded sheet, extruded board, and molded EPS. The production of PSF has been developed through a number of processes over the last 45 years. The oldest commercially available form is PSF board, first marketed by the Dow Chemical Company around 1943 under the trade name StyrofoamTM. Foam sheet was introduced in the mid 1960s, and immediately found widespread use in the packaging industry.

Polystyrene is foamed through the use of physical blowing agents. Physical blowing agents are gases or liquids which are soluble in the molten polymer under pressure. Upon depressurization, the blowing agent volatilizes, causing the polymer to foam through the formation of gas cells.

Initially, PSF was produced with volatile hydrocarbon blowing agents such as n-pentane, isopentane, and n-butane. These blowing agents pose a safety risk due to their highly flammable nature, and began to gradually be replaced with nonflammable CFCs. Recent regulations prompted by widespread concern over depletion of the stratospheric ozone layer due to the use of CFCs have caused some major producers of PSF to reevaluate their commitment to the use of CFC-11 and CFC-12, and investigate a return to hydrocarbon blowing agents or other alternatives such as HCFC-22. Currently, extrusion and EPS bead molding account for virtually all PSF product manufacturing. These two processes and their respective blowing agents are described in detail below.

4.2 EXTRUDED POLYSTYRENE FOAM SHEET

The formation of PSF sheet is an extrusion process, commonly using two extruders in series or one extruder with two sections. The process produces foam sheets 1 to 7 mm thick, with densities of 32 to 160 kg/m³ (2 to 10 lbs/ft.³)¹. A typical extruded PSF foam sheet manufacturing process

flow diagram is shown in Figure 4-1. Polystyrene pellets are mixed with a small amount (0.2 to 2 percent) of powdered nucleating agent such as talc, or a combination of citric acid and bicarbonate of soda.² This mixture is fed into the primary extruder. The extruder is heated to provide an increasing temperature profile along its length, so that the polystyrene melts. The blowing agent is injected as a liquid, under high pressure, into the primary extruder where it mixes with the molten polystyrene. A screen is used to remove impurities from the molten polystyrene before it enters the secondary extruder. The secondary extruder introduces a cooling profile that increases the mixture's viscosity and gives it enough strength to contain the blowing agent as it expands. As the viscous polystyrene mix leaves the secondary extruder through a die, it foams and partially solidifies. The blowing agent bubbles attach to the nucleating agent, and a cellular structure is formed.

An annular extrusion die is used in extruded polystyrene sheet production, resulting in a tubular form. Foaming initiates near the die outlet where the pressure rapidly decreases, allowing the blowing agent to volatilize. As the foamed polystyrene passes through the die, compressed air is applied, forming a skin on the outer surfaces. Additional foaming occurs outside the die as the polystyrene tube passes over a forming mandrel, which determines the final circumference of the foam tube. At the end of the mandrel, the tube is slit lengthwise, flattened out, and an S-wrap, or sheet wrapping unit, winds the sheet into a roll. The PSF sheet is then stored for two to five days. During this time, a portion of the blowing agent diffuses out of the foam cells and is replaced with air. This results in an optimum ratio of air to blowing agent within the foam cells, which will allow for postexpansion of the PSF during reheating, before thermoforming.

Thermoforming is a process in which the extruded PSF sheet is reheated, then pressed between the two halves of a metal mold to form the desired end product such as fast food containers. After thermoforming, the molded shape is trimmed, sometimes printed, and packaged. Resulting scraps are ground and sent to scrap storage silos. This scrap is introduced into the primary extruder with virgin polystyrene. Polystyrene scrap typically makes up 35 percent of the total polystyrene fed to the primary extruder.

4.3 EXTRUDED POLYSTYRENE FOAM BOARD

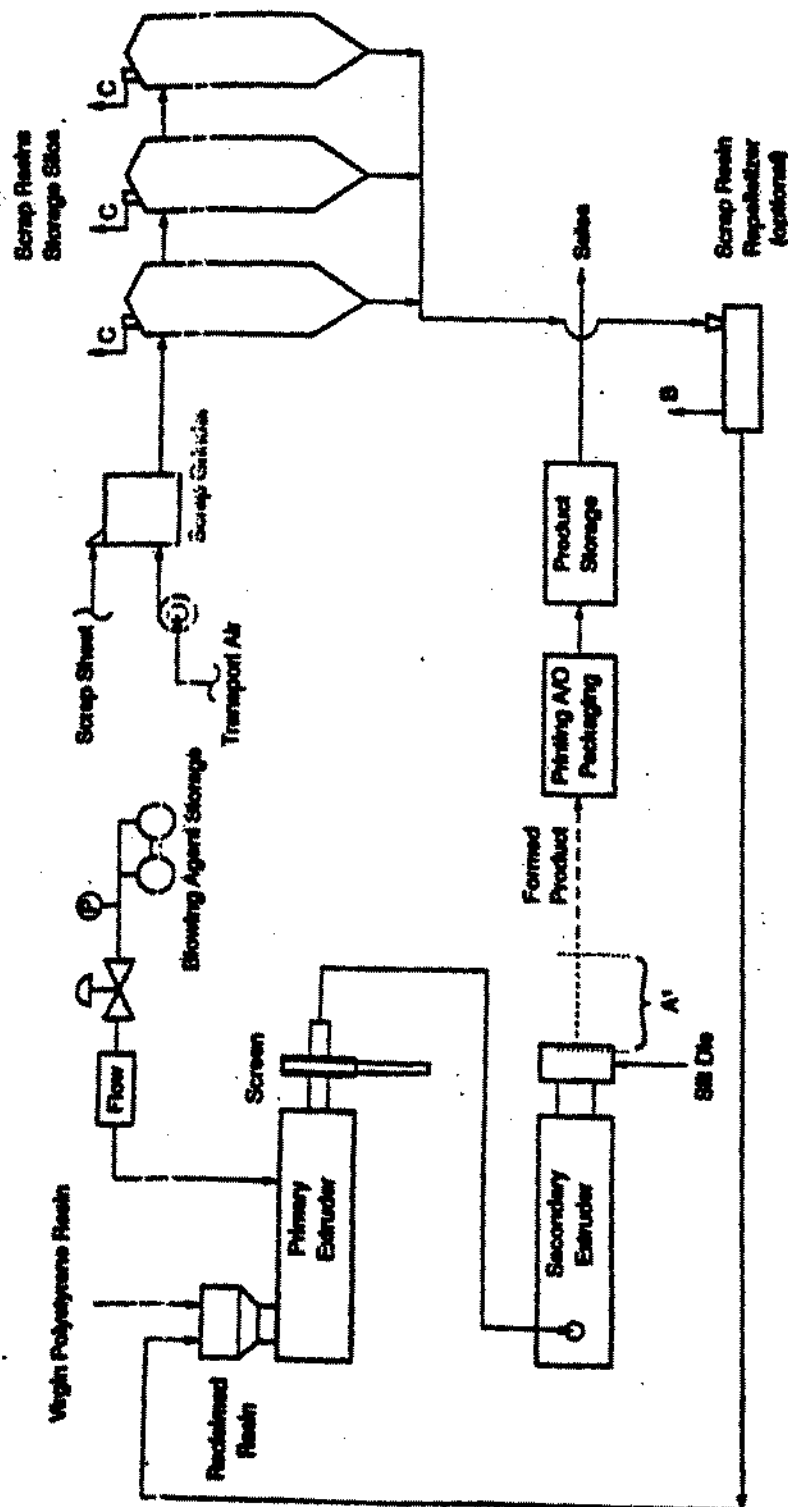
Polystyrene foam board ranges from 1.25 to 15 cm thick, with densities of 21 to 36 kg/m³ (1.3 to 4 lbs/ft³). The extrusion of PS foam boards is identical to that of PS foam sheets, with the exception that a simple slit aperture die is used instead of an annular die so that board is extruded as slabs rather than a tube. Following cooling of the PS board, it is trimmed to size and packaged. A typical PSF board manufacturing process flow diagram is shown in Figure 4-2. Some board is laminated with facing materials that act as a vapor barrier or aid in the retention of low conductivity gas.⁴

4.4 EXPANDABLE POLYSTYRENE (EPS)

Expandable polystyrene is produced from spherical polystyrene beads which have been impregnated with a volatile hydrocarbon such as pentane. The polystyrene beads are produced by polymerizing styrene in a water suspension and adding a volatile liquid such as pentane as a blowing agent. The beads typically contain five to seven percent by weight of the blowing agent. Prior to use the beads are stored at ambient temperatures in cartons with vapor barrier plastic liners to inhibit premature diffusion of the blowing agent from the beads.⁵

A typical EPS bead manufacturing process flow diagram is shown in Figure 4-3. Normally, the beads are expanded in one step and molded in another. Expansion is promoted by exposing the beads to a continuous flow of steam or hot air at temperatures of 212°F to 220°F within a process unit called a pre-expander. Batch and continuous processes are common. A typical EPS batch pre-expander process is shown in Figure 4-4. The transfer of heat vaporizes the volatile hydrocarbon trapped in the polystyrene matrix; the volatiles are released from the matrix causing the beads to foam and expand. This is the stage where the density of the raw beads is brought to approximately the density required for molding. The amount of expansion is controlled by steam pressure and temperature, and the bead feed rate.⁶ This process is generally performed in a continuous mode.

Following the expansion process, the excess moisture acquired during steaming is eliminated with hot air, and the beads are transported to storage silos constructed of large mesh bags, where they are allowed to cool.⁷ The beads are allowed to age for 4 to 24 hours, during which time a



Note:

**• CFC capture system is not existing.
Need to be developed.**

Potential CFC Recovery Points

- | | |
|----------|---|
| A | Outside and Inside Extruded Bubble |
| B | Repelletizer Extruder Vent |
| C | Exhaust from Pneumatic Transfer of
Flaground Scrap Foam to Silos |

Figure 4-2. Flow Diagram of a Typical Polystyrene Foam Board Manufacturing Process

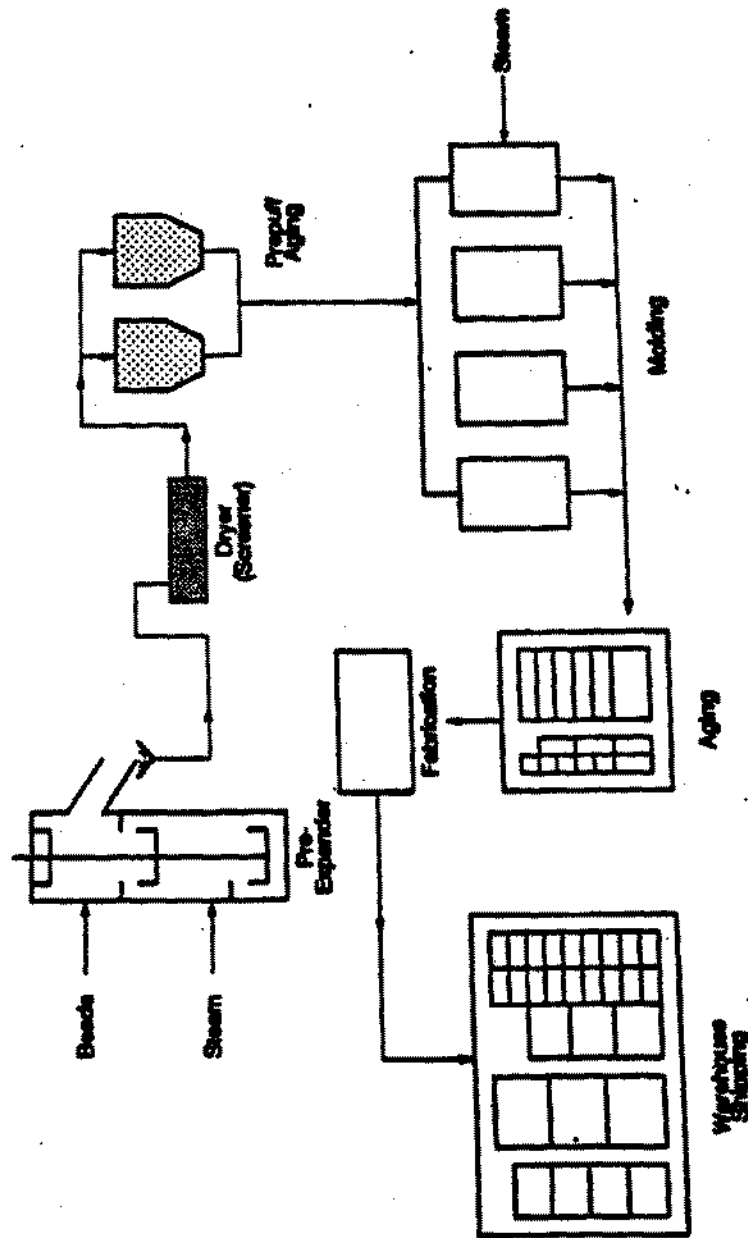


Figure 4-3. Flow Diagram of a Typical EPS Bead Process

portion of the remaining trapped volatile compounds evaporates, and is replaced with air that diffuses into the beads. Air may be pumped through the beads to accelerate the aging process. There are three types of molding: shape, block, and cup molding.⁸

In shape molding, a premeasured amount of expanded beads is fed to a preheated split cavity mold. The beads are exposed to steam through small holes in the mold. The beads undergo further expansion, become soft and molten due to the transfer of heat from the steam, and fuse together under these conditions to form a single polymer mass. Following the expansion and fusing process, the mold and PSF part are cooled by circulating water through the mold. The mold is then opened, and the molded part is ejected by compressed air, mechanical pins, or manually. Shape-molded polystyrene foam products have densities ranging from 1.0 to 2.5 lb/ft³.⁹

In block molding, pre-expanded beads are molded into large blocks of densities from 0.8 to 1.0 lb/ft³.¹⁰ Following cooling and intermediate storage, the blocks are sliced into sheets or custom fabricated shapes.

Cup molding uses smaller beads and lower blowing agent content than block or shape molding. Small beads are used to accommodate the thin walls of the cup molds. Cup density is over 3.5 lb/ft³.¹¹ Cups are molded at a moderate temperature; the final product is packaged in plastic and boxed for shipping.

4.5 POLYSTYRENE LOOSE FILL PACKAGING

Polystyrene loose fill packaging is manufactured with a combination of extrusion and bead expansion. The following process description is taken from the South Coast Air Quality Management District's Staff Report for Proposed Rule 1175.

Recycled and new polystyrene are mixed with a nucleating agent and melted, as for extrusion. The blowing agent is injected under pressure, and the viscous mix is extruded, foaming as the blowing agent evaporates, and forming hollow strands as it exits through the die. The hollow strands are cut into 3/4-inch pieces. The strands are then steamed for further expansion, as are EPS beads. Intermediate aging follows, and then the strands are further steam expanded, dried in ovens, and aged. The density of loose fill is about 0.2 lb/ft³.¹²

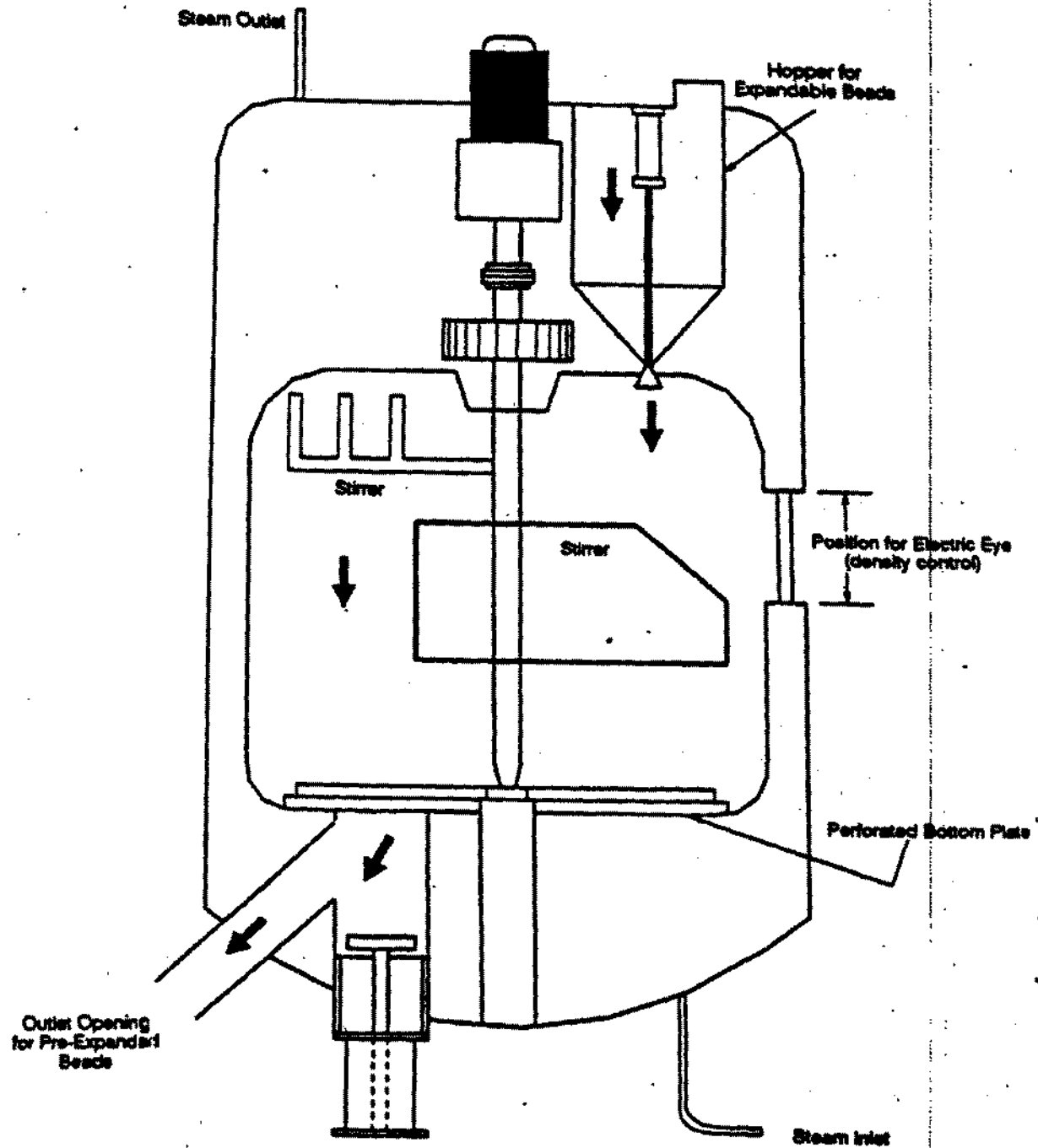


Figure 4-4. EPS Batch Pre-expander

5.0 PROCESS EMISSIONS

5.1 PROCESS EMISSIONS OVERVIEW

For processes using hydrocarbon blowing agents, VOC emissions are known to occur at various phases of PSF manufacture and use. There are three general classes of emissions: manufacturing emissions, prompt foam cell loss, and banked emissions. Manufacturing emissions are the loss of blowing agent during processes prior to storage of the final product. Emissions from extrusion, thermoforming, and scrap grinding during PSF sheet manufacturing, and pre-expanding and molding emissions during EPS manufacturing are examples of manufacturing emissions. Prompt foam cell losses occur in the first one to two months following manufacture, either during storage and shipping, or consumer use. Banked emissions are associated with PSF boardstock production and, therefore, are limited primarily to CFC-12 emissions. Banked emissions result when a portion of the blowing agent sealed in the closed cell structure of the boardstock slowly diffuses out of the foam over a long period of time. Generally, this occurs during consumer use of the product. The half-life of CFC-12 in PSF board, for instance, is estimated to be anywhere from 40 to 200 years.

In addition to the three general classes of emissions discussed above, manufacturing losses can be further classified as fugitive or point source emissions. Point source emissions originate from a single location such as a process vent or exhaust stack. Fugitive emissions originate from larger, more general areas such as storage warehouses.

The manufacturing processes described in Section 4.0 afford different opportunities for blowing agents to escape. Industry-generated data exist on points of emissions during manufacturing and the percentage of blowing agent lost at each of these points. Characterization of VOC emissions from the EPS bead process was developed from an industry study based on emission measurements from 20 to 25 plants.¹ The emissions profile for the

extrusion process is based on blowing agent emissions data from several producers and on dialogue with representatives from major extrusion companies.

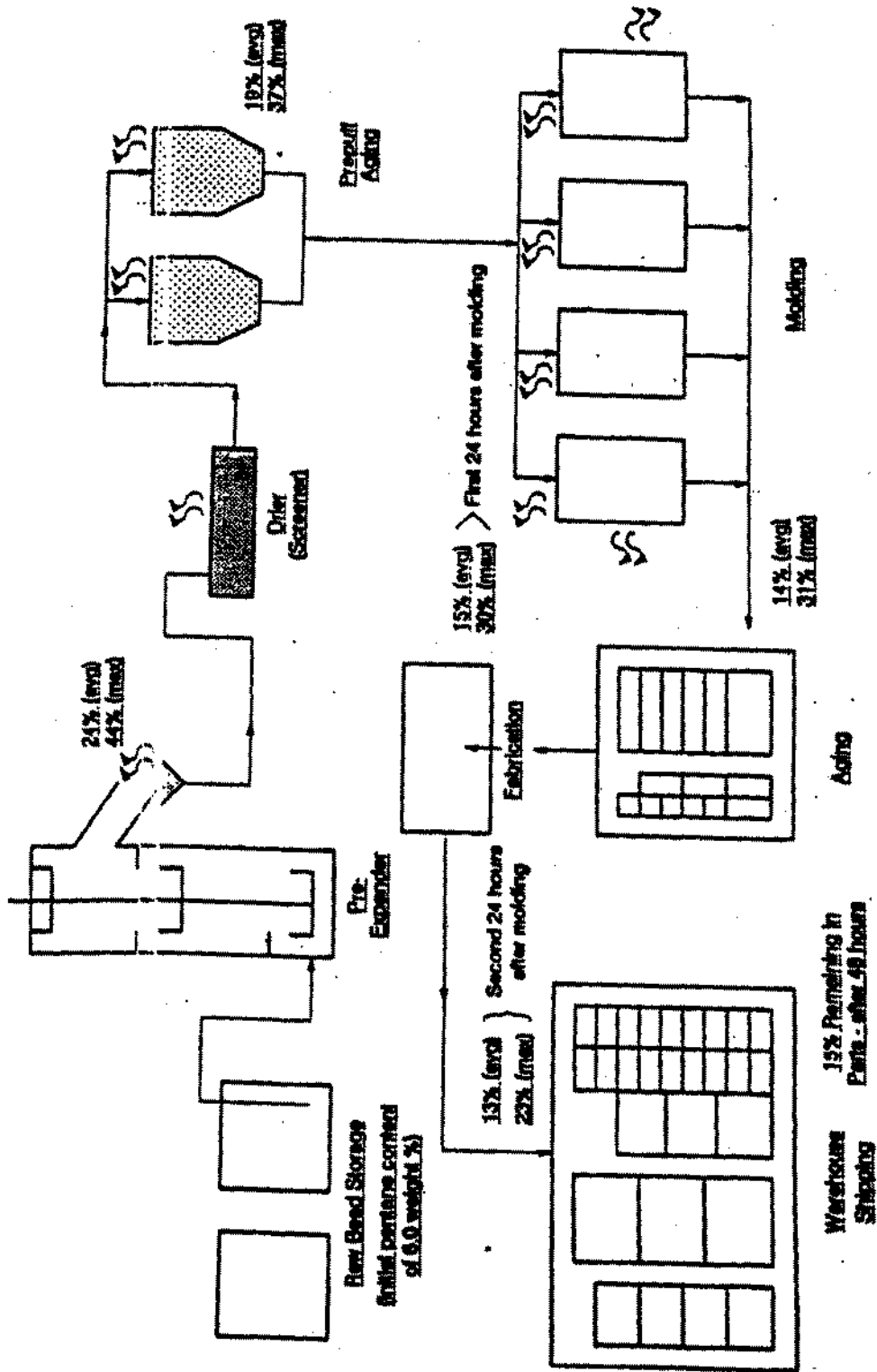
5.2 EMISSIONS SOURCES

5.2.1 Expandable Beads

As described in Section 4.0, EPS beads are produced by injecting pentane into polystyrene resin. The beads are expanded, and molded or cut in a separate process, usually at a different facility.

Manufacturing emissions of VOC occur primarily during expanding (blowing) and molding. Pentane emissions are also known to occur during bead impregnation.² In some cases, bead impregnation occurs during the styrene polymerization process. These particular emissions are addressed by proposed Standards of Performance for New Stationary Sources: Propylene, Polyethylene, Polystyrene, and Poly(ethylene terephthalate) Manufacturing Industry [52 FR 36678, September 30, 1987].³ However, a small number of companies inject pentane into polystyrene resin. Emissions that may occur during this process are not covered by the NSPS; this report addresses only those EPS emissions that occur as part of the expansion and molding processes. There are several points of emission during the expanding and molding process. Figure 5-1 shows points of manufacturing emissions and the percentage of total blowing agent (pentane) emitted at each point.

Total weight percent of pentane in raw beads is from 6 to 7.5 percent. This is the optimal concentration of blowing agent; less would prevent expansion to desired densities, and more would not significantly improve the product. Pentane concentrations can be lowered by using it in combination with other blowing agents, such as CO₂. Alternative blowing agents and blowing agent combinations are discussed in Section 6.3. Pentane loss analysis figures from an industry study demonstrate that EPS bead pentane is lost primarily during expansion and molding. Additional significant losses occur during storage and shipping, and fall in the category of prompt foam cell losses (see Table 5-1). The end product will typically have an average pentane weight of less than two percent.



From: Caughman, R.B. The Pentane Issue. Presented at 16th Annual SPI Expanded Polystyrene Division Conference, March 17, 1998, San Diego, California.

Figure 5-1. Average and Maximum Percent Pentane Losses at Manufacturing Emissions Points for EPS Facilities

**TABLE 5-1. PENTANE LOSS ANALYSIS FOR EPS BEAD PRODUCTS⁴
(Percent of Original Pentane Blowing Agent)**

	% Lost During Expansion	% Lost During 24 Hrs. Storage of Prepuff	% Lost During Molding	% Lost 1st 24 Hours after Molding	% Lost 2nd 24 Hours after Molding
Average	24	19	14	15	13
Range	10-44	5-37	4-31	5-30	3-23

Average % pentane left in molded product after 48 hours = 15%.

NEW AMD TYPE P 1500/0 PRE-EXPANDER

ASSUMPTIONS

ORIGINAL VOC CONTENT - 7.0% (SEE ATTACHMENT H)

% OF VOC EMITTED = 85% (RADIAN REPORT I)

FORMULA: TYPICAL RAW MATERIAL (2,496,000 # X .07 X .85/2000 = 74.256 TYP

1200 LBS. OF EXPANDED POLYSTYRENE PER HOUR MAXIMUM

8 HOURS PER DAY OF PRE EXPANSION

MAXIMUM OF 9600 LBS. PER DAY

MAXIMUM OF 1,248 TONS PER YEAR

COMBINED EMISSIONS FROM PRE-EXPANDERS, PREPUFF STORAGE, MOLDING PRESSES, 1st 24 HOURS AND 2nd 24 HOURS AFTER MOLDING.

FROM EXISTING REPORT DAILY EMISSIONS IS 38 LBS. ANNUAL EMISSIONS 13.6 TONS.

ADDITION OF NEW PRE-EXPANDER DAILY EMISSIONS IS 571 LBS. ANNUAL EMISSIONS IS 74.256 TONS.

NEW COMBINED DAILY EMISSIONS IS 609 LBS. ANNUAL EMISSIONS 87.856 TONS.

RECEIVED
JUL - 7 2003
Department of Environmental Quality
State Air Program

DESCRIPTION OF EXPANDED POLYSTYRENE:

THE EPS RAW MATERIAL IS RECEIVED BY TRUCKLOADS AT A MAXIMUM OF 42 BOXES @ 1000 LBS. EACH. THE MATERIAL IS RECEIVED IN AND THE ANALYSIS FOR PENTANE IS WITHIN REQUIRED SPECIFICATIONS. FROM THERE THE MATERIAL IS STORED UNTIL NEEDED FOR PRE EXPANSION. AT THAT POINT ONE BOX AT A TIME IS DUMPED IN A HOPPER, THEN TRANSPORTED TO THE EXPANDER BY AN AUGER. THE PRE EXPANDER PRE WEIGHS THE RAW MATERIAL PRIOR TO BEING PUT INTO THE EXPANDER. THE RAW MATERIAL INSERTED INTO THE EXPANDER AND EXPANDED BY STEAM. WHEN THE REQUIRED DENSITY IS MET THE EXPANDED MATERIAL IS DUMPED INTO A FLUID BED DRYER WHERE IT IS COOLED AND DRIED BY AIR. AFTER BEING DRIED IT IS TRANSFERRED TO STORAGE BAGS WHERE IT IS ALLOWED TO AGE FROM 6 - 48 HOURS. AFTER THE AGING IT IS THEN TRANSFERRED TO EITHER SHAPE MOLDING PRESSES OR THE BLOCK MOLD. THE EPS IS PUT INTO A MOLD AND BY USING STEAM IT CREATES A FUSION PROCESS TO BOND THE EPS BEADS TOGETHER. THE PARTS ARE THEN STORED FOR CURING AND READY FOR CUTTING AND SHIPPING.

RECEIVED

JUL - 7 2003

Department of Environmental Quality
State Air Program

APPENDIX B

NW Design Molders, Inc., Jerome

Permit No. T2-030407

Tier II Processing Fee Calculation

PTC Fee Calculation

Instructions:

Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

Company: NW Design Molders, Inc.
 Address: 280 Rose Street
 City: Jerome
 State: ID
 Zip Code: 83338
 Facility Contact: Gary Bremer
 Title: President
 AIRS No.: 053-00005

- N Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N
- Y Did this permit require engineering analysis? Y/N
- N Is this a PSD permit Y/N (IDAPA 58.01.01.205)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/Yr)	Annual Emissions Reduction (T/Yr)	Annual Emissions Change (T/Yr)
NO _x	0.0	0	0.0
SO ₂	0.0	0	0.0
CO	0.0	0	0.0
PM10	0.0	0	0.0
VOC	60.7	0	60.7
TAPS/HAPS	0.0	0	0.0
Total:	60.70	0	60.7
Fee Due	\$ 5,000.00		

Comments:

Tier II operating permit and permit to construct processing fee, in accordance with IDAPA 58.01.01.200-228 and IDAPA 58.01.01.400-481.

APPENDIX C

NW Design Molders, Inc., Jerome

Project No. T2-030407

Response to Public Comments

**Response to Public Comments
Submitted During the Public Comment Period
for the NW Design Molders, Inc. , Jerome Tier II Operating Permit and Permit to Construct
T2-030407
AIRS Facility No. 053-00005**

As required by IDAPA 58.01.01. 404.02.b and 58.01.01.209.01.c of the Rules for the Control of Air Pollution in Idaho (Rules), the Idaho Department of Environmental Quality (DEQ) provided proposed Tier II Operating Permit and Permit to Construct (Tier II OP/PTC) No. P-030407 for public notice and comment. Public comment packages, which included the application materials, the proposed permit, and the associated air quality statement of basis, were made available for public review at DEQ's Twin Falls Regional Office, the Twin Falls Public Library, and DEQ's state office in Boise. The public comment period for the Tier II OP/PTC was provided from September 25, 2003, through October 27, 2003.

Only one person provided comments during the public comment period. Comments were emailed to DEQ on 10/7/03, 10/16/03, and 10/18/03. This document provides DEQ's responses to the comments submitted. Each comment is listed below with DEQ's response immediately following.

It should be noted that for comment Nos. 1 and 2 below, DEQ responded to the commenter by email. In this document, DEQ is including all comments received as well as all responses to the comments.

Comment No. 1.

The following comment was emailed to DEQ by Mr. Lee Halper on 10/8/03: "Does this permit application take into account the levels of VOC's emitted by the Northside's CAFO in the context of cumulative effect?"

Response to Comment No. 1

The following email was DEQ's response to comment No. 1:

"Dear Mr. Halper,

Thanks for your comment regarding the NW Design Molders operating permit. With regard to your question concerning the levels of VOC emissions from the Northside CAFO in context of cumulative effect, the Idaho Department of Environmental Quality (DEQ) does not regulate emissions from CAFOs. Emissions from CAFOs may be regulated under the Department of Agriculture.

If you have any substantive comments related to the NW Design Molders operating permit, please send them to Joan Lechtenberg of DEQ.

Thank you again for the comment.

Sincerely
Harbi Elshafei
Analyst III
Stationary source Program
Idaho DEQ
(208) 373-0505
Fax: (208) 373-0154"

Comment No. 2

The following comment was emailed to DEQ by Mr. Lee Halper on 10/16/03:

"Mr. Elshafei,

The Industries that DEQ regulates have certain limits on their emissions. I am assuming that these limits are set by taking into account all the other emission levels in an area, the size of an operating, available technology to reduce emissions, monitoring and other factors. The goal of these limits is to keep air pollution below CAA or the other regulatory standards. Even though ISDA may, through the MOU, have regulatory authority, DEQ still has the statutory duty to ensure compliance. IF ISDA doesn't properly regulate or monitor toxic emissions that may contribute to air pollution and thereby causes DEQ regulated Industries to contribute to an exceedance of limits, the buck stops on DEQ's (EPA's) desk. You cannot ignore other sources of air pollution just because they are not directly overseen by DEQ because, in fact, they are overseen by DEQ. I cannot understand how you would approve a permit for VOC's for NW Design or any other business without knowing ALL the VOC contributory factors since NW Design's emissions may be the straw that breaks the camel's back.

Mr. Lee Halper"

On 10/16/03, Mr. Halper emailed to DEQ the following question:

"Dear Mr. Elshafei,

You have not answered my question, whether the proposed permit application takes into account the levels of VOC's emitted by the Northside's CAFOs in the context of cumulative effect? A yes or no will suffice. Thank you.

Lee Halper"

Response to Comment No. 2

The following email was DEQ's response to comment No. 2:

"Mr. Halper,

Your latest question cannot be answered with a simple "yes" or "no." Permit reviews are based on established procedures. Specifically, DEQ issues air permits in accordance with IDAPA 58.01.01 et seq, Rules for the Control of Air Pollution in Idaho. As specified in these Rules, facilities may be classified as major sources or minor sources.

Permit review of applications for minor sources is less involved than review for major sources. NW Design Molders is classified as minor source. Consequently, in accordance with the Rules, permit review for this facility did not involve a detailed assessment of aggregate impacts to the airshed.

DEQ appreciates your comments and participation in the public participation forum. As part of the public participation process, your comments as well as comments from all parties will be responded to by the DEQ. The final responses to comments will be available as part of the final permit action, and will be available for review by members of the public.

Thank you.

Sincerely

Harbi Elshafei

Analyst III

Stationary source Program

Idaho DEQ

(208) 373-0505

Fax: (208) 373-0154"

Comment No. 3

The following comment was emailed to DEQ by Mr. Lee Halper on 10/18/03:

Mr. Elshafei, Thank you for the reply. You state "Consequently, in accordance with the Rules, permit review for this facility did not involve a detailed assessment of aggregate impacts to the airshed." Can you tell me what type of facility requires a detailed assessment of aggregate impacts to the airshed? Thank you. Lee"

Response to Comment No. 3

NW Design Molders is NOT a major stationary source as defined by 40 CFR 52.21(b) because it is not one of the 28 listed sources with a potential to emit greater than or equal to 100 T/yr, and it is not any other stationary source with a potential to emit greater than or equal to 250 T/yr. The proposed modification by NW Design Molders is not major in and of itself.

New major PSD stationary sources and major modifications to existing PSD major stationary sources are required to include emissions from other stationary sources within their impact area on a pollutant-specific basis to determine compliance with ambient air quality standards. An impact area is determined through ambient air quality modeling. Emissions from stationary sources located within the impact area and emissions from major stationary source located directly outside the impact area must be included in the ambient air quality analysis.

Because NW Design Molders is not a major stationary source and because the proposed modification is not major in and of itself, emissions from other sources are not required to be included in the ambient air quality analysis.